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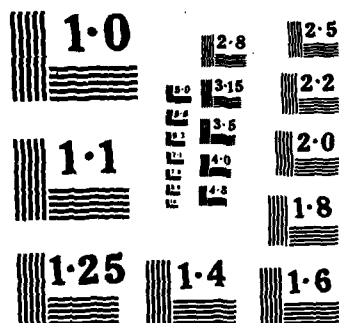
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AIR COMMAND AND STAFF COLLEGE

STUDENT REPORT

ENTER Z-100:
NEWEST MEMBER OF THE CHAPEL TEAM

MAJOR EMILIO A. CHAVIANO 85-0455

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**Submitted to the faculty in partial fulfillment of
requirements for graduation.**

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PREFACE

The main purpose of this paper is to introduce the reader to some of the possible uses of the Z-100 computer in the work of the typical Air Force chapel. It is intended for chaplains and chapel managers who want to turn the new chapel computer into a "partner in ministry." An effort was made to either avoid or explain computer terms which might be unfamiliar to readers without a background in computers. The author wishes to acknowledge Chaplain, Colonel Douglas Jones for his guidance; Chaplain, Major Robert Gilman for his patience and sound advice; and Major Harvey Moody for his technical counsel and long hours of word processing support.

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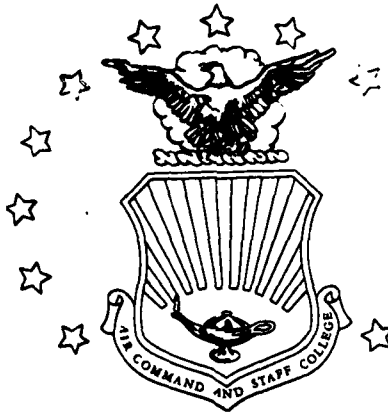
ABOUT THE AUTHOR

The author was born in Santa Clara, Cuba. In 1961 he migrated to the United States and completed his high school education that same year. In 1968 he obtained a B.S. in Psychology from Florida Southern College and a Master's of Divinity from Emory University in 1970. The author was ordained as a minister of the Methodist Church and served appointments in Miami and Tampa until 1976. That same year he received a commission in the Air Force and since then has served as a chaplain at Tyndall AFB, Zaragoza AB, and Chanute AFB. He has had a life-long interest in electronics and more recently in personal computers.

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REPORT NUMBER 0455

AUTHOR(S) CHAPLAIN, MAJOR, EMILIO A. CHAVIANO

TITLE ENTER Z-100: NEWEST MEMBER OF THE CHAPEL TEAM

I. Purpose: To explore ways in which the Z-100 microcomputer can become an effective tool in support of the Air Force chaplaincy.

II. Problem: Although the Z-100 is now available at most USAF chapels, its full potential impact on the chaplaincy is not widely understood. Effective use of the Z-100 requires some degree of computer literacy, familiarity with software, and the application of basic security principles.

III. Data: The Z-100 is a very powerful and flexible computer that can serve the computing needs of the USAF chaplaincy for many years to come. The main practical uses of this computer include word processing, desk management, data processing, graphics, and the financial spreadsheet. These applications in the work of the chapel depend on the type of software that is used. Integrated software seems to meet the needs of the typical program, but there are several other packages that can be used as well. A successful chapel computer system is more than the hardware and software that make it up. It also involves the protection of resources as well as the privacy of the information contained in the system.

CONTINUED

IV. Conclusions: Chaplains and chapel managers need to avoid the extremes of computer phobia and computer mania. The Z-100 can really enhance the ministry of the chapel by freeing the chaplains from many tasks so that they can spend more of their time ministering to persons.

V. Recommendations: Chaplains and chapel managers at every level should become familiar with as many computer applications as possible. Besides the more common applications of the Z-100, electronic mail should be explored. Two other important areas where computers should be used are religious education and the new field of management skills training.

Chapter One

INTRODUCTION

Computers are changing our world in ways never imagined by science fiction writers of only fifty years ago. This cybernetic revolution is occurring throughout the world and it is having its impact on The Christian Church. As a part of that church, the Air Force chaplaincy has also been touched by the technology of the microprocessor. The impact of computers in the church is giving birth to computerized Christendom (7:14).

The computer world can be a baffling, frustrating, confusing place. It uses a language often called "computerese," and it deals with technology which is way above most of its users' understanding. This can confound even the most brilliant minister, Air Force chaplain, full time church worker or chapel manager. When facing the dilemma of learning a wholly new and different language, many church workers frequently wonder if it's worth the effort.

The main objective of this paper is to explore ways in which the Z-100 microcomputer can become an effective tool in support of the Air Force chaplaincy and its mission. In order to accomplish this task, the author will explore in Chapter Two the basics of computers in general. The aim here is to try to dispel some of the fear and resistance related to computers. The second part of that chapter will take a closer look at the new standard micro for the Air Force. This section about the Z-100 is rather technical and mainly intended for those who have some basic knowledge about microcomputers.

In Chapter Three, the author will take a look at some of the ways in which the Z-100 can become a practical tool in the chapel office. Such functions as word processing, electronic mail, desk management, data processing, graphics and the spreadsheet will be explored in some detail. An attempt has been made to help the reader see how some of the above mentioned functions apply to the work of the chaplaincy and what the benefits are.

Chapter Four has been dedicated to take a quick look at some of the software available for the Z-100. There is so much software in the market that the author does not believe chaplains and chapel managers should spend time trying to write their own programs. The concept of integrated software is introduced and

Several popular programs relevant to the work of the chaplaincy are reviewed.

The advent of the microcomputer has posed new problems and concerns in the area of security. Chapter Five deals with some of the same concerns related to main-frame computers, but takes a look at how they will affect the operation of a microcomputer in the chapel. The author has chosen to deal with the issues of security, risk analysis, outage plans and finally that of privacy. This chapter also deals with the issue of usage of a microcomputer for personal use in the Air Force environment.

Finally, in Chapter Six, the future is explored. What is ahead for the Air Force chapel as far as using the microcomputer as a tool for the ministry? The author writes about the importance of computer literacy as a way to fight computer phobia. Is there a place for electronic mail and local area networks? The author believes that this is the way of the future and that more and more the use of paper communications will be reduced in the years to come. There are many uses for a computer in the church or chapel, but one that sooner or later will become reality is in the area of education. Whether it is religious education in the church school or the learning of new management skills, the computer is bound to become a permanent member of the "faculty" in the chapel teaching staff.

The paper ends with some recommendations for those in position to experiment, recommend, and implement ways to best use the 2-100 in the chaplaincy. The paper does not attempt to cover every aspect of microcomputer operation. It is only intended to be an eye opener for those who still have not become "converts."

Chapter Two

ENTER THE COMPUTER

Over the past twenty-five years, the world has become significantly altered as a result of the computer and the rapid technological change associated with computer technology. The average citizen has come to depend upon the technology of the computer revolution to regulate his way of life. We have come to rely on the speed and accuracy of the computer. Printed circuit technology has made it possible to develop very small circuits, vastly improving the performance of modern computers; performance so dramatic that in many applications the modern computer appears god-like.

Time's "Man of the Year" for 1983 was a machine, the computer (20:3). This award was given to underscore the ever increasing role the computer plays in our daily lives. Today, owning and operating a personal computer (PC) is well within the means of the average income American family. The home computer is a reality because of the rapid advances in microelectronic technology. Those developments make it possible to sell a computer with twice the memory of the venerable IBM model 360 for about one thousand dollars. Inexpensive, small computers, called microcomputers, have also become important tools in both small and large businesses.

This chapter will attempt to describe, in brief, simplified terms the basic components and functions of a computer. The second part of the chapter will examine those elements and functions as they apply specifically to the Z-100 microcomputer. The author hopes that this chapter will help dispel some of the fear that persons without a technical background usually have about computers. Once we stop seeing the computer as a fast adding machine and come to view it, instead, as a mechanism for the representation and execution of procedures, we recognize the need to direct our attention away from the machine itself toward the procedures it executes (4:63).

COMPONENTS

Most computers have four basic components: input devices, storage, central processing unit (CPU), and output devices. These components function together to bring information, hold and

obtain copies by writing to: AFSCOASO, DSDO/DMT, Gunter AFS, AL 36114-6340.

The chapel's Z-100 will sit idle until it is properly energized and internally guided by the best software available for your needs. Those responsible for the operation of the chapel microcomputer should take time to become familiar with the different software options now available under the Zenith contract and start using to the fullest this powerful partner in ministry.

Support Activities have the Z-100 available, they will also have ready access to the "data" that will enable them to make more and better decisions. The microcomputer and the right type of software will actually increase the knowledge and the power of the chapel staff. The intrinsic merit of the axiom "Knowledge and human power are synonymous" have been universally accepted by the world's military leaders long before computers came into our lives (19:55).

This increased power is now available to the chapel staff with the advent of the Z-100. The computer is excellent at performing database management tasks, but as we have said before, any computer is only as good as database management as the data that is put into it and the software program that manipulates the data. Under the Zenith contract, two database management programs are offered, Condor 3 and dBase II. We have already taken a look at PeachText 5000 and LOTUS 1-2-3 but their database management capabilities are fairly limited when compared to Condor and dBase II (21:8).

dBASE AND CONDOR

The dBase II program is widely known and has an excellent reputation as a database management program on microcomputers. This program has become the standard against which all other database management programs are compared. Condor is much more "user friendly" to the "new-comer" on microcomputers. One of its important advantages is that the user can employ program "language" in fairly logical "English sentences" rather than "computerese" statements to manipulate the data. Both programs have their strong points as well as limitations. The user needs to decide what his needs are and then select the software that best fits his particular situation. Condor is definitely easier for the first time user to use than dBase II. dBase II has better math handling capabilities than Condor, but its 32 field limit can be a hindrance (21:9).

What does all of this mean? Well, if the database management application is primarily aimed at the manipulation of "text" data, then Condor is probably the program for you. If, however, your database needs depend heavily on number manipulation, especially with greater than two decimal places or complex math operations, then dBase II is probably the better choice.

This author has gained a great deal of knowledge about available software for the Z-100 from "Byte Line." This publication is an information exchange distributed quarterly by the Air Force Small Computer/Office Automation Service Organization (AFSCOASO). Z-100 operators will benefit greatly from reading the informative articles in "Byte Line" and can

volunteer groups) or individual members of the chapel community. The program can also be used to print out the address labels for the mailing envelopes.

PeachCalc is a good version of a first-generation spreadsheet program. However, this program lacks some of the features of some second-generation programs such as faster calculation speeds, advance cell formatting, sorting, block labeling, and graphics. The biggest drawback is that one can create a spreadsheet that can be input to PeachText, but one cannot create a spreadsheet in PeachText that can be input to PeachCalc.

LOTUS 1-2-3

Those who need a more capable spreadsheet program should become familiar with LOTUS 1-2-3. LOTUS is not a word processing system, it is not a relational database management system, and it is not a communications system. LOTUS is a very powerful spreadsheet program with excellent business graphics and a simple data management capability (14:13).

LOTUS is very easy to use thanks to a supplied tutorial disk which provides all the necessary information to generate simple spreadsheets and graphs. The Data Management function is treated as a large spreadsheet with a maximum size of 256 cells wide by 2048 cells in length. This of course is limited by the amount of memory installed in the computer. The graphics function is very easy to use and runs extremely fast. LOTUS is capable of producing line charts, bar charts, pie charts and combinations of these with ease. Graphs and charts can be produced on the screen or on one of the supported graphics devices which include printers and plotters.

The author can foresee the day when the Installation Staff Chaplain will ask his Chief of Support Activities for a visual aid showing how the chapel funds are being spent. In a matter of a few minutes an overhead projector slide could be prepared graphically depicting all of the information requested. Properly used, the Z-100 and the right type of software will become essential tools in the performance of the Air Force chapel mission.

Database management represents one of the primary uses of computers. For the average manager, the ready access to data is vital to the decision making process. To be useful, this information must be readily accessible, relevant, presented in a useful format, and adaptable to changing circumstances. All of the above factors are relevant to the mission of the Air Force chaplaincy. Now that Installation Staff Chaplains and Chief of

It is plain to see how integrated software can spare our chapel managers from having to become familiar with different documentation and procedures for a number of different programs. PeachText 5000 contains a word processing program (PeachText), a Thesaurus (Random House Electronic Thesaurus), a spelling package (Spelling Proofreader), a list or label processor (List Manager), and a spreadsheet program (PeachCalc).

PeachText is a version of the old Magic Wand word processing program. It is very easy to use, screen-oriented word processor, which has most of the standard features, such as cursor control, deletions and insertions, block manipulations, and search and replace functions. One of the nicer features is the capability of previewing the finished document in the format in which it will be printed by sending it to the screen rather than the printer. It also has the capabilities to send the finished document to a disk for storage and to print out one document, while editing another. Output from the spreadsheet program may be inserted in the text of a document and it is easy to include portions of other documents. One important application of all of the above capabilities would be in the preparation of financial reports and chapel fund minutes. Once the system is in full operation, the time savings in the financial management area alone will be dramatic.

The Random House Electronic Thesaurus is another of the programs integrated into PeachText 5000. It is entered by pressing one function key from the word processing program. It enables the operator to replace the word pointed to by the cursor with another word from the thesaurus. This capability is great when creating a document directly with the word processor without writing it out in full before keying it in. The thesaurus has over 4000 words with over 26,000 synonyms. This reserve of words should be more than adequate for the type of writing that takes place in the average base chapel office.

The Spelling Proofreader should put an end to embarrassing spelling errors in the worship service bulletins. This is an automated method of checking the spelling in a document using an internal dictionary containing over 20,000 words. The document will be scanned at the rate of 3,000 words per minute. Any other words not found in the dictionary may be added, marked for later correction, or skipped. The SEARCH command in PeachText can then be used to find the words which have been flagged.

The List Manager is not a database management system. It is a software package great for making labels and simple lists. List Manager interfaces with PeachText when creating form letters by including selection criteria. For example this software package would be very useful to produce letters to base newcomers, members of different chapel organizations (choirs, classes,

Chapter Four

SOFTWARE: THE SPIRIT WITHIN

The software of any computer is, in essence, its mind and soul. It is the software that provides the Z-100 with its ability to function as a valuable tool for the Air Force chapel office. This chapter will examine software that can support chapel functions when used with the Z-100. The author will discuss the concept of integrated software and review software packages such as PeachText 5000, Lotus 1-2-3, dBase, and Condor.

INTEGRATED SOFTWARE

The current computer buzzword is "Integrated Software" (16:8). The integrated concept is an excellent one and basically involves having several different types of packaged software, such as a word processor, a spreadsheet program, a database manager, communications software, and graphics, all integrated into one package. Most of the integrated software packages currently on the market have one predominant program and then the other programs work within this frame work.

This author believes that integrated software is the most effective approach to follow as we utilize the Z-100 in our chapel programs. It seems that word processing, financial management, and database management will be the primary uses for the newest member of the chapel team and if all of these functions could be found in one package, the end result would be a simple and error free operation.

PEACHTEXT 5000

One such package is found in the PeachText 5000. This is an integrated software package produced by Management Science American, Inc., which is centered around the word processing program. Their method of integration was to purchase or write each individual program, then modify them so that they operated under the same master menu and utilized the function keys in a like manner (16:8).

The chapel funds bookkeeper and the Z-100 are destined to become best friends. The financial management of the chapel will become the main beneficiary of computer technology in the chaplaincy. The time spent in bookkeeping will be reduced and the accuracy of computations will increase as our chapel managers integrate their Z-100's into the funds management operation. The computer will also help produce the monthly minutes and fill out the financial forms.

This chapter has presented an overview of the main practical applications for the Z-100 in the typical Air Force chapel. The author realizes that the needs of each particular chapel section and the resources available are different in each case. Chaplains and support personnel will find that word processing, electronic mail, desk management, data processing, graphics, and the financial spreadsheet are just some of the main uses for the Z-100. Later in this paper some other applications for the computer will be explored. The next chapter will take a closer look at software, or as this author prefers to call it, "the spirit within the computer."

groups, and any other relevant information. By using Condor, the chaplain and support staff could create reports from this database that could answer almost any question about lay persons involved in the different chapel programs.

GRAPHICS

Closely related to the programming languages is the Z-100's graphics package. This package allows the user to demonstrate statistical or numerical data in pictorial form. With today's graphic packages, such as Graftalk, the users can format their own charts and line graphs. All one has to do is select the depiction mode, define the labels, enter the numbers, and select the colors for the output of the plotter. This tool can save a great deal of time in the preparation of briefings that contain significant amounts of statistical data. A good plotter can even make transparencies for overhead projectors.

Someone has said that one graph is worth a thousand numbers, and this author believes that this is true in the secular world as well as in the world of the Air Force chaplaincy. The mission dictates that every Installation Staff Chaplain will have to present a briefing to a Staff Assistance Visit team or to the I. G. A good briefing becomes even better when visual aids are included, and the Z-100 can assist in making such slides. It should be pointed out that in addition to the computer a quality plotter must be used to create this type of transparencies. Financial reports to the chapel congregations will also have more appeal if graphics are used to support the numerical data presented.

SPREADSHEET

Spreadsheets were the first easy-to-use systems for performing mathematical operations on tables of numbers. If a word processor is like an editor who helps to create, edit, store, and print text, then a calculation spreadsheet is like an accountant or calculator that will help to create, store, edit, print and carry out arithmetic operations on numbers (9:79). The operator can enter labels and columns of numeric data and have the program compute any desired totals. The success of Visicalc, the first calculation spreadsheet, was so dramatic that it and the Apple computer have become household words (9:82). The Z-100 is able to run SuperCalc, a program that made the spreadsheet easier to use and a great deal more flexible. The important thing to remember about a "Calc" program, is to make sure the disk storage file spreadsheets created by the program can be read by the word processing program available to the organization.

facilities that the Z-100 can become the "master calendar." It would be a simple matter for chaplains and other lay personnel to input their activities into the computer calendar through the Chief of Support Activities.

The tickler function of a desk management program can help chaplains avoid conflicts and eliminate embarrassing mistakes. This function provides a printed reminder to the interested parties a few days prior to the scheduled event. The telephone directory and calculator functions are additional capabilities that can be utilized by chapel managers as they perform their support work for the chaplain staff.

DATA PROCESSING

Another important application for the Z-100 is data processing or database management. A database system is a software program that allows users to create and use files to maintain information in an organized manner. The microcomputer will never take over all of the functions of the data automation department and its giant mainframe computers, but it will certainly distribute some of the workload down to the user level.

Database processing uses a collection of integrated data for a variety of related applications. An organization might develop several databases, each related to specific applications. For example, a chaplain in charge of religious education might have a database containing information on audio-visual materials, books, supplies, etc. The database would provide an easy way to keep an up-to-date catalog of what is available at the chapel in support of the religious education program and keep it all organized according to any system or categories that meet the local needs.

It has been suggested that data processing has perhaps the greatest value to the Air Force leader (10:68). Having information available and organized in a meaningful manner makes for more effective leaders. By using a program called Condor, the chaplain can create an electronic filing cabinet that can store, sort, and retrieve data all in the form of valuable information.

Another typical information producing application for Condor would be the creation of a chapel roster of all lay workers involved in the parish programs. This roster, in the form of a database, could contain the following data on each person involved with the programs: name, rank, date of birth, sex, date arrived on station, home address, duty phone, home phone, number of dependents, spouse's name, interests, membership in chapel

ELECTRONIC MAIL

Another capability of the minicomputer is that they can communicate with each other as they perform their word processing function. Many firms are using their communications capabilities to send documents electronically between offices. Not only does it save time and mailing costs, but it also assures that the information is provided as needed, when needed. Electronic mail (EM) enables a user to format a textual message, address selected recipients, transmit the message, and receive almost instant confirmation of receipt. Organizations use communications between word processors to transmit information, memos, letters, and other documents between departments or buildings as well as to remote locations. Today's more advanced systems allow for the creation of a priority system, confidentiality through a security system, and the storing of selected messages.

The emergence of electronic mail as a business tool has not occurred overnight. It has taken nearly ten years for electronic mail to capture the corporate imagination. In 1984, computer-using business men and women sent more than 100 million electronic messages (11:71). Electronic mail is a reality in the business world where time literally means money. This author believes there is also a place for electronic mail in the chaplaincy. There are great possibilities in this area and they need to be explored. For example, the sending of reports from base chapel to command level or the Resource Board "sending" by electronic mail the latest list of resources for ministry. Chapter 6 will explore other possible uses of EM.

DESK MANAGEMENT

Desk management is nothing more than a series of tools to help the user to manage his time. It is made up of the following functions: scheduling, tickler file, telephone directory, and calculator.

Scheduling is simply the maintaining of a personal calendar within the computer. This function allows the executive and his secretary to set up appointments without having to consult with each other to find an open time. It also allows the scheduling of meetings by having the system compare the calendars of the participants and finding a common open period. The tickler files are reminders that the user can have generated at specified times. The telephone directory function can often be divided into business and personal sections. The calculator function makes the terminal act like a desk-top calculator.

If there is a place where computer scheduling is needed, it is in the typical Air Force chapel. The chapel is such a busy place, with so many chapel and base programs requesting time and

Chapter Three

APPLICATIONS

The "Man of the Year" has come to work at the Air Force Chaplain's office. The Z-100 has been delivered to many chapel sections throughout the Air Force and by the end of 1985 there should be one available to every Installation Staff Chaplain (ISC) and his Chief of Support Activities (CSA). This chapter will explore practical ways in which the Z-100 can be used to support the work of the chaplaincy. Important applications of the computer are word processing, electronic mail, desk management, data processing, graphics, and the spreadsheet. Let us see how each of these applications can support the chapel program.

WORD PROCESSING

One of the most common applications of the computer is word processing. Another way to look at word processing is to think of a computer working like a supertypewriter (9:14). Word processors handle textual information--entering, sorting and printing words. With word processing the operator has the ability to take a prepared document, edit it for spelling errors and typos, add/delete words or letters, or even move paragraphs or sentences to other locations. It is possible to type documents using a justified format which produces even margins.

One of the most important uses of the Z-100 in the chapel will be as a word processor. A good example is the creation of files containing the favorite bulletin styles of the different chaplains on the staff. It would be a simple matter to insert the proper scripture readings, sermon titles, and hymn selections without having to re-type a new bulletin every week. The word processor will also be a tremendous help in the composition of the chapel news letter. This task can take many hours if done manually, but the computer can assist the composition and reduce the time factor considerably. Other possible uses will be in the handling of welcome letters, historical reports and filling of Air Force forms among others.

MPI 99 and 150 among others. The all-in-one unit weighs fifty pounds and measures 13.5" H x 19.5" W x 19.5" D. The Z-100 is designed to operate on either 120 or 240 volts at 50 or 60 Hz with a maximum power consumption of 400 watts (25:4).

In this chapter the author has taken a look at rather technical terms and aspects of computer hardware. It is his hope that the reader is not discouraged by the mystical character of the computer. The main idea to remember is that the Z-100 is a very powerful and flexible microcomputer and that it can serve the needs of the Air Force chaplaincy for many years to come. In the next chapter we will explore some practical ways in which the Z-100 can become a "partner in ministry."

system it runs under, as well as the applications software that is available. Let's take now a closer look at some of the features of the Z-100.

Most microcomputers are based on microprocessor chips. These devices are tiny integrated silicon circuits. Also called central processing units, the microprocessor performs all logical and arithmetic functions. The Z-100 has an 8-bit 8085 that operates under CP/M-85 and a 16-bit 8088 that operates under Zenith's version of Microsoft's MS-DOS called Z-DOS (10:65). The twin microprocessors allow both 16-bit and 8-bit software to be run on the same computer. Sophisticated 16-bit applications permit significantly accelerated data manipulation. One drawback of this system is that the two processors do not communicate with each other (10:66). In other words, there is no way, at present, to transfer data from the 8-bit side to the 16-bit side and vice-versa.

With the increased usage of 16-bit microprocessors, we have seen a trend toward systems with greater memory capacity. Where 64K was once the standard memory for business microcomputers, today 128K micros are fairly standard. The Z-100 system comes with 192K of random access memory (RAM) and it can be expanded in increments of 256K to a maximum totals of 768K. The memory expansion cards plug into an S-100 bus which has four vacant slots. The Z-100 comes with two RS-232 connectors accessible from the rear of the unit. These ports allow the computer to interface with other systems at baud rates of 110 to 38,400 in either asynchronous full or half duplex and synchronous modes.

The Z-100 comes in two basic configurations, both all-in-one units. Option A comes with 2-320K, 5 1/4 inch floppy disc drives. Option B comes with 1-320K, 5 1/4 inch floppy and a 10 megabyte hard disk drive. The monitor screen measures twelve inches and features a non-glare green or amber phosphor tube. The monitor displays 24 lines of 80 characters plus a 25th "information" line and can display 225 lines of 640 dots for graphic execution. This capability allows the Z-100 to display and print upper and lower case, underlining, sub- and superscripted text (10:65).

The design of contemporary keyboards has changed and reflects a desire to produce a more efficient, easier-to-use interface for the text and data entry. The Z-100 keyboard is organized like an IBM Selectric typewriter. It has 77 alphanumeric keys, including 13 function keys, plus an 18 key numeric keypad, cursor control keys, insert/delete character, insert/delete line, and a "help" key. The system also has an audible click that sounds when keys are struck.

The Z-100 is equipped with a Centronics parallel printer port, which allows the use of such printers as Diablo 620, 630, 1610, 1620, 1640, 1650; Epson MX-80; and Texas Instruments TI-81;

that large amounts of data can be stored on relatively small devices. Likewise, the computer performs only very simple calculations, for instance it can either add or subtract, but not both. If a computer is of the variety where addition is the only operation, then subtraction is accomplished by adding negative numbers. Multiplication and division are accomplished by a series of additions or subtractions, respectively. However, due to the electronic circuit technology, the speed with which the computer performs calculations is extremely high.

A computer can only do what a programmer has instructed it to do. The computer can only "decide" between two choices, "yes" or "no" or as stated previously, the computer proceeds along a path predetermined by the instructions within a program. By using simple logic in constructing the decision making rules of the program, the programmer makes the computer serve his needs. The aim of this discussion on computers is to emphasize that although computers are capable of performing monumental feats they should not be feared to the point of creating undue apprehension in people. Rather, it should be the goal of the user of computer technology to obtain a basic knowledge of what the computer may be able to do for him and his organization. He does not have to understand precisely how the computer works. For years chaplains and chapel managers have been using different types of audio-visual equipment in the work of the chapel. In the past few years they also have been using video recording machines in support of different programs. However, most of the users do not have a complete understanding of the technology involved in the functioning of such devices. What really matters is to know what the machine can do and then use it to its utmost capability.

Next we will take a look at the Z-100 computer and see in more specific ways how this microcomputer is built and what are some of its capabilities. Just like a pilot needs to have a working knowledge of his plane, the chapel staff needs to have some understanding of what makes that new appliance in the chapel office work.

ENTER THE Z-100

In October, 1983, the Air Force and Navy signed a joint contract with Zenith Data Systems to purchase 10,000 microcomputers. The selected system, the Z-100 has become the "standard" micro for the Navy and Air Force (10:65).

Common to most microcomputers are standard components such as a main console, keyboard, display and storage devices. The main console usually houses the microprocessor, the memory, the electronics, and the input/output (I/O) interfaces. Other features often associated with a micro are the type of operating

process it, and then make it available as an end product in some meaningful and usable fashion. Input and output devices such as keyboards, light pens, disk drives, cathode ray tubes (CRTs), etc. transmit the complex, coded data used by the computer. The CPU translates that complex data into symbols or information which we can understand and employ, locates data in storage and performs tasks such as mathematical operations, data comparisons, or logical manipulations of the stored information.

When humans are given a problem to solve, they are given some facts related to the problem. The devices they use to accept this knowledge might be the eyes, ears or any of the other senses. The computer also needs information which is entered by way of an input device. An input device might be a keyboard, an optical scanner or a hand held light pen which sends a signal to the CRT screen.

Storage or memory can be thought of as millions of post office boxes, each having the ability to hold a piece of information and each having a separate address. Actually, each location in the memory is a magnetic element which can be electrically charged to an "on" or "off" setting. This situation provides us with what has been called a binary system, i.e. a system of two states. When a number of post office boxes are linked together and by setting certain combinations of the boxes in the "on" and "off" position, numbers or alphabetic characters may be represented.

The processes that allow humans to solve a problem are controlled by certain parts of the human brain. The computer has a director, a central processing unit, which controls the entire procedure and coordinates the interaction of the parts of a computer as they work together. When several instructions are combined to perform some task, the result is a computer program. In a stored computer program, the CPU reads and executes the instructions stored in the memory. The instructions are carried out one by one and as each instruction is executed, different parts of the computer system are activated. If the instruction calls for input, the input device is activated; if a calculation has to be performed, the arithmetic unit is brought into action. The sophistication of computer programming, coupled with the lightning speed of the computer circuitry, is what makes the image of the computer seem so mystical.

FUNCTIONS

There are three basic functions of a computer which make it the powerful tool that it is: storing information, performing calculations, and making decisions (3:6). The storage of information has already been discussed. It is very interesting

Chapter Five

COMPUTER SECURITY

Microcomputer security can be understood in terms of protection of a person's, company or military organization's assets, its computer hardware, its programs, and its data files. It also implies the assurance that the microcomputer systems will operate accurately and without interruption (6:1). There are some steps that apply to the establishment of security programs. These steps are: appointing a computer system security officer, performing risk analysis, implementing a computer security awareness training program, and developing contingency plans to provide for computer system outages (23:3). Finally this chapter will deal with the important subject of privacy.

SECURITY OFFICER

A chapel program computer is likely to handle sensitive information; therefore, someone should be tasked to develop a computer security program. AFR 300-8 requires as the first step in a security program, the appointment of a computer system security officer (CSSO). The security officer will develop a written computer security program. The program should be written down even for a small office with few people and a single computer (23:4).

There are two main reasons why the chapel computer needs to be taken seriously from the security point of view. The first one is that the chapel's Z-100 will be handling information about members of the different chapel programs. Some of this information may be considered sensitive and under the protection of the Privacy Act. The second reason is that one of the main uses of the chapel computer will be in the area of finances. Care should be taken that unauthorized personnel do not gain access to files related to the chapel funds. These are only two areas of concern, but to identify others, each chapel must conduct a risk analysis.

RISK ANALYSIS

An important task for the security officer is to become aware of the many risks to which the chapel computer is vulnerable. These risks can range from theft of the Z-100 to the ill effects of dust or static electricity in the computer room. The second step in the process of managing these risks is to identify all of them correctly. This can, and indeed must be done systematically. The best procedure is to list all possible threats and then eliminate those that do not apply to the particular computer system (8:313). The procedures are located in Attachment 5 of AFR 300-8 and they involve identifying all computer resources, such things as hardware, software, facilities, physical environment, personnel, and documentation. Threats and vulnerabilities to these resources are evaluated to determine risks. If the risks are unacceptable then pertinent security measures are developed. This procedure is then repeated until the level of risk is acceptable. Computer security is not to be taken lightly and proof of this is the interest that the Air Force Office of Special Investigations has taken in this area.

At the present time the Air Force Office of Special Investigations (AFOSI) is actively involved in assisting organizations to develop more secure computer systems. The AFOSI's Computer Crimes Division has recently developed a computer vulnerability and threat assessment survey. It examines Air Force computer systems to ensure they are being used only for official purposes. The AFOSI examines manuals, policies, procedures, and how the organizations are protecting classified or sensitive information and data covered by the Privacy Act (17:46). The teams visit only at the invitation of an organization commander, who is the only person who gets a copy of the team's report. The exception is when a team uncovers some form of criminal activity. Because computer security is important, chapel personnel should participate in a training program. Not only will a security training program make the operation more secure, but it will also dispel any fears that chaplains and managers might have about computer security.

SECURITY TRAINING

Another task that needs early attention is a computer security awareness training. All persons with access to the computer need to understand that they have a stake in computer security. The staff should be involved in planning and periodically reviewing the security plan. A recent research study

revealed that the average computer thief is a white-collar worker who is not a repeat offender. Such violators can be swayed by policy statements that describe acceptable employee behavior and by peer pressure (1:89). For the base chapel computer security program, it is important to start by holding informal sessions with the responsible base agencies such as the Data Processing Installation (DPI) officer, Security Police, Civil Engineering and local OSI.

Some of the security problems with computers can be attributed to mismanagement of systems. It all starts when someone makes an exception and puts a game, biorhythm chart, or some other personal program on the computer. That kind of activity can very easily get out of hand:

Determining whether a computer is being used properly depends on the formal policy that's been established. It isn't uncommon for a computer facility to have a training system so workers can increase their proficiency. If some workers are taking college computer courses, they might be authorized to use a computer to increase their proficiency. That could lead to trouble if guidelines aren't set up in advance. A conflict could develop in the case of someone who operates a private business at home, and is also taking a college course in programing. If that person is allowed to use an Air Force computer to improve programming techniques, but uses it to write a program that helps conduct a private business, then that would definitely be considered improper (17:47).

OSI studies show that authorized users commit as much as 85 percent of computer abuse and crime (17:48). Those responsible for the management of the microcomputers in the Air Force chaplaincy should consider adopting a policy for computer use similar to that used for government vehicles. Because it is difficult to draw the line once exceptions are made, the Air Force's policy is that government vehicles will not be used for personal business. It is the author's opinion that the same reasoning should be applied to the use of the chapel computer.

COMPUTER OUTAGE PLANS

While developing a computer security program, it is also important to develop a contingency plan for computer outage. A computer can go down for any number of reasons and the Air Force IG has directed tests of computer outage contingency plans during inspections (23:5). The consequences of losing the computer temporarily or permanently must be considered. The development of contingency plans should be an orderly process. The contingency

plan for any data processing system, regardless of its size or scope of operations, should, as a minimum, consider the following three elements: emergency response, backup operations, and recovery actions.

Emergency response deals with procedures to cover the appropriate response to such events as fire, flood, water damage, bomb threat, or natural disaster, to protect lives, limit damage, and minimize the impact on the data processing operations. Backup operations are procedures to ensure that essential data processing tasks can be conducted after disruption to the primary facility. Backup capability includes such needed materials as files, programs, paper stocks, and preprinted forms, in addition to the more obvious need for compatible hardware. Recovery actions are procedures to facilitate the rapid restoration of data processing facilities following physical failure or destruction, or loss of data.

The development of a successful contingency plan depends on recognition of the potential consequences of undesirable events against which protection is needed. Microcomputer systems use many resources, people, programs, data, hardware, power and even paper forms. All resources are not equally important, nor are they equally susceptible to harm. Therefore, cost-effective protection is heavily dependent on the following (6:211):

- . an awareness of the facility's relative dependence on each of its component parts,
- . knowing, at least in an overall way, what the chances are that something undesired will happen to each component,
- . a determination of the effects of undesirable events so that action can be taken to minimize either the chances of their happening, the loss if they happen, or both.

PRIVACY

One very important task for those who operate a microcomputer is the protection of the privacy of individuals. As mentioned earlier a typical use of a micro in an Air Force chapel would be to maintain a database on active members of the chapel program. The privacy issue has probably generated more publicity during the last 15 years than any other issue related to computers. Former Supreme Court Justice Brandeis described the concept of privacy as the "right to be let alone - the most comprehensive of rights and the right most valued by civilized men" (5:133). Former Justice Douglas characterized privacy as the freedom of the individual "to select for himself the time and

circumstances when he will share his secrets with others and to what extent" (5:133). Privacy thus defined is infringed upon by the collection of details about a person's private life, no matter how accurately or carefully it is done. Even more offensive is the dissemination of that information to others, whether they be private or public users of that information.

Computer security should be foremost in the minds of those responsible for the operation of the Z-100 in the base chapel. In an interview with Mrs. Nita Mitchell, office manager for Frazier Memorial Methodist Church, it became apparent that security and protection of privacy are top concerns in that church's computer operation. According to Mrs. Mitchell only a few persons in the 5,000 member church are authorized to access information about the membership. Such is the concern for the safekeeping of private information that the ministers do not have access to the passwords which control most of the files (24:-)

The basic goals of a security program should be to preserve the availability, integrity, and confidentiality of all data processed by hardware and software. Small computer systems must comply with provisions in AFR 300-8 and other applicable guidance. Chapel managers need to become familiar with AFRs 12-35 and 300-13 to implement procedures for protecting personal data in their computer systems, according to the Privacy Act of 1974.

Chapter Six

THE FUTURE

Now that the Z-100 has arrived, we can be sure that it will continue to play an ever increasing role in the life of the Air Force chapel program. If the positive impact of the computer on the business world is any indication, the church will also be able to reap the benefits of the computer revolution. This chapter deals with some of the trends chapel personnel can expect in the years to come. The author has identified terms such as computer phobia, computer literacy, electronic mail, local area networks, management skills training and Computer Assisted Education (CAE) as important for chaplains and chapel managers to know.

COMPUTER PHOBIA AND LITERACY

A review of the microcomputer literature reveals that thousands of efficient, progressive managers are avoiding the use of office automation. This resistance or fear of the computer has been called "computer phobia" (13:54). This phobia seems to be the result of lack of familiarity with the computer and the functions it performs. Any new technology brings with it a certain amount of resistance. This is certainly the case when operating a computer, where at the touch of a key it performs just about any task faster than human hands or brain, and with more accuracy. Some people, especially executives, are postponing their personal use of these instruments. A Business Week/Harris Poll, released in 1983, revealed that of the executives sampled, 55 percent had never engaged in computer training (13:54).

The above mentioned executives had the impression that those who operate computers are technical prestidigitators. Or, they postpone their personal acquaintance with computers because they think others can handle the computer work while they get things done the old way; or they believe they just don't have time to learn. Managers on both sides of the Atlantic have given many alibis for not using office automation in their organizations (10:53). This author hopes that Air Force chaplains and chapel managers will see the Z-100 as a friendly tool rather than as a technological mystery.

The key to overcome any possible fear of the computer is to become "computer literate." This simply means to understand the basic functions, components, and applications of the computer. It does not mean having a complex knowledge of all the technical aspects of computing. In reality all it takes to overcome computer phobia is an introductory course that covers the basics of computing. The Weyerhaeuser Company recently sent a questionnaire to its corporate staff, asking if anyone would be interested in taking an introductory microcomputer class. More than 1500, or almost 50 percent, of the employees at the company's Tacoma, Washington headquarters responded "yes" (19:124). This is just one example of how progressive companies are making it possible for their employees to overcome fear of the computer with knowledge.

This is the type of knowledge that chapel personnel can get from a Z-100 familiarization course that is now offered at Keesler AFB. The course runs for five days and is intended for the functional user. It introduces the new user to microcomputers and provides basic knowledge of some of the software available on the Zenith Z-100. Chapel programs in the Air Force will be greatly enhanced as chapel managers become familiar with "the newest member of the chapel team." Once the fear barrier is broken, chaplains and managers will be able to explore the fascinating computer application known as electronic mail.

ELECTRONIC MAIL

Is there electronic mail in the future for the Air Force chaplaincy? This author believes that it is just a matter of time before we start using the technology now available to send and receive information over telephone lines. All that is required besides the Z-100 is an additional unit called a modem and software designed for communications purposes. The modem is an interface device that connects the computer to the telephone line and enables the Z-100 to act as a communications terminal.

The trend in the business world is toward connecting two or more computers into communication systems or networks. In 1983, only about five percent of all microcomputers were connected to any type of network (15:49). However, estimates indicate that within five years 20 percent will be part of a system. Considering the current large installed base of microcomputers and the continuing growth in the number of component shipments per year, millions of micros will be interconnected in one way or another by 1987 (15:49).

There are many ways in which the chapel microcomputer could be connected to other computers. Several base level organizations can tie their micros to the large mainframe computer making it possible for a flow of electronic mail to exist. A practical

application of such a system would be instant communications from the base hospital about patient admissions or the housing office communicating names of new personnel assigned to base housing. Inter-office information flow will be fast, as it happens and it will save time as well as other resources.

A working model of such a network is a new system that is being installed at the Pentagon by BDM Corporation. This system is based on the OMNINET local area network, developed by Corvus, and uses Apple microcomputers (15:50). Approximately 10 computers are interconnected and the Pentagon expects to use them to draw graphics, prepare slide presentations, access data bases and use the network for electronic mail. With a system like this any of the information generated at one station can be transmitted to all the terminals in the network or to any selected locations.

MANAGEMENT SKILLS

An important use of the computer in the corporate office can also be useful in the chapel section. The trend in today's corporate environment comes in the form of a new breed of training software that teaches managers to become more effective. The principle behind this type of software is rather simple: Leadership comes down to finding the most effective method of solving specific problems. The manager learns by doing rather than by digesting management theory (22:107).

The U.S. Army is taking advantage of this training capability to facilitate the logistics of training its officers. The Army has bases all over the world and an officer corps numbering in the thousands. To move officers at regular intervals to training centers is tremendously expensive. To cut this high cost, the Army is in the process of redesigning its training program. First on their agenda is to purchase personal computers for the various bases and find appropriate software to instruct officers in management techniques.

The program is in its infancy, but early results are encouraging. So far the Army has purchased about 50 personal computers, and the initial software currently under evaluation is the Thoughtware Management Training Series. This package consists of the Management Diagnostic Series, which assesses the ability of a person as a manager, and the Management Training Series, which shows how to apply managerial skills to solve a specific business problems (22:108).

This type of tutorial software could be of great value to the Air Force chaplaincy. The individual chapels could buy the package or several copies could be kept at a central location to circulate on a loan basis. Another possibility would be to offer these courses as electives at the chaplain school. The

possibilities of the Z-100s as a teaching tool for chaplains and managers are endless. It is up to those who are doing the daily work of the chaplaincy to determine their educational needs and turn the Z-100 into a member of the "teaching faculty" at the base chapel.

RELIGIOUS EDUCATION

If the chapel personnel can benefit from the Z-100 as a teaching tool, then we can expect to see the microcomputer in the religious education program of the future. The volunteer teacher will never disappear from the religious education program, but computer technology can be employed as a tool to enliven dull classes, produce new interests, and generate a flurry of creativity in both teachers and students. Indeed, one of the greatest potential uses of a computer in a chapel is in the church school. In the future, Computer Based Education (CBE) could become the most significant use of a computer in the church (7:101).

There are now several companies producing religious software that could be used in our chapel programs. Micro Information Publishing & Research Inc. of Lake, Minnesota says that next year the \$2.6 million religious software market -- which includes educational, entertainment, and self-awareness programs -- will grow 65 percent to \$4.3 million. The number of programs will grow to 250 from 67 (18:6). The following is a sample of some religious software now available:

- . Suncom Inc. of Wheeling, Ill., has produced a 2,700 question biblical trivia game called Bible Edition I. The author is a Catholic priest.
- . Personal Software Co. of Salt Lake City, Utah, is selling introduction to Mormonism. Included in the package are hymns and songs for children.
- . The Institute for Computers/Jewish Life in Chicago sells a series of 16 programs. One program called Bible Baseball quizzes students on the Old Testament. A correct answer gives the student a chance to play a computer-generated baseball game.
- . Homeware Inc. of Ruston, La., markets a Christmas Story. Baby Jesus, Mary and Joseph are all created graphically on the screen, and the story is played out to computer music.

In order to create a computer based education program in the chapel, several computers or terminals would be needed and the cost of such a system could very well be out of the reach of many

programs. However, the future may well see religious education chaplains experimenting with one or two computers to enhance the teaching-learning environment of the chapel church school. Another instructional area where the microcomputer could be used is in the teaching of Adult Value Education at Technical Training Centers. Computers are ideal to play simulations which can be designed to help the student examine his value system.

Chaplains working in the area of religious education would be ill-advised to ignore the potential benefits of CBE. Our children and youth are exposed to computers in the secular educational world, making more imperative for the church school to experiment and try to find ways to employ Computer Based Education.

In summary, the computer has come to the chaplain's office and it is here to stay. Some day there will be a terminal on every desk in the chapel section, just like today there is a telephone. Every effort should be made to expose chaplains and chapel managers to different training programs in order to achieve literacy and reduce computer phobia. The opportunity to experiment with electronic mail is now a reality and the information flow at every level can be enhanced by using the Z-100 as a communications terminal. Chaplains also have available to them the opportunity to turn the Z-100 into a tool to hone their management skills. Finally, now is the time for chaplains working with religious education to start dreaming about the use of computers in their programs and to experiment in this area even if in very modest ways.

Chapter Seven

FINAL RECOMENDATIONS

In closing the author will make some recomendations about the use of the Z-100 in the chapel program. This chapter presents some practical ideas in the areas of computer literacy, applications, software , and computer mania.

There is a wealth of materials available which can assist chapel personnel in becoming computer literate. The author highly recommends the book Selecting The Church Computer by William R. Johnson. Johnson is a United Methodist minister and comes from a strong computer background. He is able to explain technical matters in terms that the average person can understand. Even though this book was written with the civilian church in mind, much of its contents apply directly to the Air Force chapel situation.

Along the same line the author has found Government Computer News to be an excellent publication for those who will operate the chapel microcomputer. This is a newspaper serving computer users throughout the Federal Government. It contains highly informative articles about microcomputers, software reviews, and useful ideas on computer applications. The mailing address for GCN is 1620 Elton Road, Silver Springs, MD 20903.

Another important publication for the Z-100 user is Sextant. This one is an independent magazine for the entire Zenith computer community. This magazine provides a wealth of information about the Z-100 and is published bimonthly by Sextant Publications Co., 716 E Street SE, Washington, DC 20002.

In the area of applications the author hopes that chapel personnel try to emulate the business world and venture into the applications of electronic mail. Communications between the command chaplain's office and base chapels is a simple task that will only require the addition of a modem and communications software. The transmission of information by electronic mail will avoid delays and make that information available when needed.

The subject of available software was treated in some detail in this paper. There is plenty of software now available in the market that can meet the needs of the typical chapel program. It would not be "cost effective" for chaplains or chapel managers to

spend valuable time trying to write their own programs for the Z-100. It would appear that chaplains can best benefit when using the computer as a tutorial instrument to increase their management skills. Ideally the Z-100 will be used in ways that free the chaplains to do ministry. The idea of a chaplain tied down to a computer keyboard seems like a contradiction. The Z-100 has come to the base chapel to support ministry, not to take the chaplain away from those who need to hear the word of the Lord.

Finally this author wants to warn chaplains and chapel managers against the possibility of becoming victims of "computer mania." This "mania" is the opposite of computer phobia and it is the tendency to think that computers can meet every human need. In spite of all the wonders a computer can perform, it can never equal or replace the personal touch of caring persons. Chaplains could use the advice of Barron Hilton when it comes to using computers in a personal services endeavor. Hilton, the Chairman of The Board and President of Hilton Hotels Corporation, says: "although automation is playing a larger role than ever, it will never replace friendly smiles " (12:11).

The Air Force chaplaincy cannot afford to get carried away with the wonders of computer technology. Chaplains and managers need to maintain their personal touch, caring ability, and the love and patience only committed persons can provide. Welcome the Z-100 with open arms. It is a powerful friend that has come to help the Air Force chaplaincy as it moves in ministry into the 21st century.

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